



SIEMENS

Industrial Gas Turbines

# SGT-750 Gas Turbine

## Proven technology. Verified results.

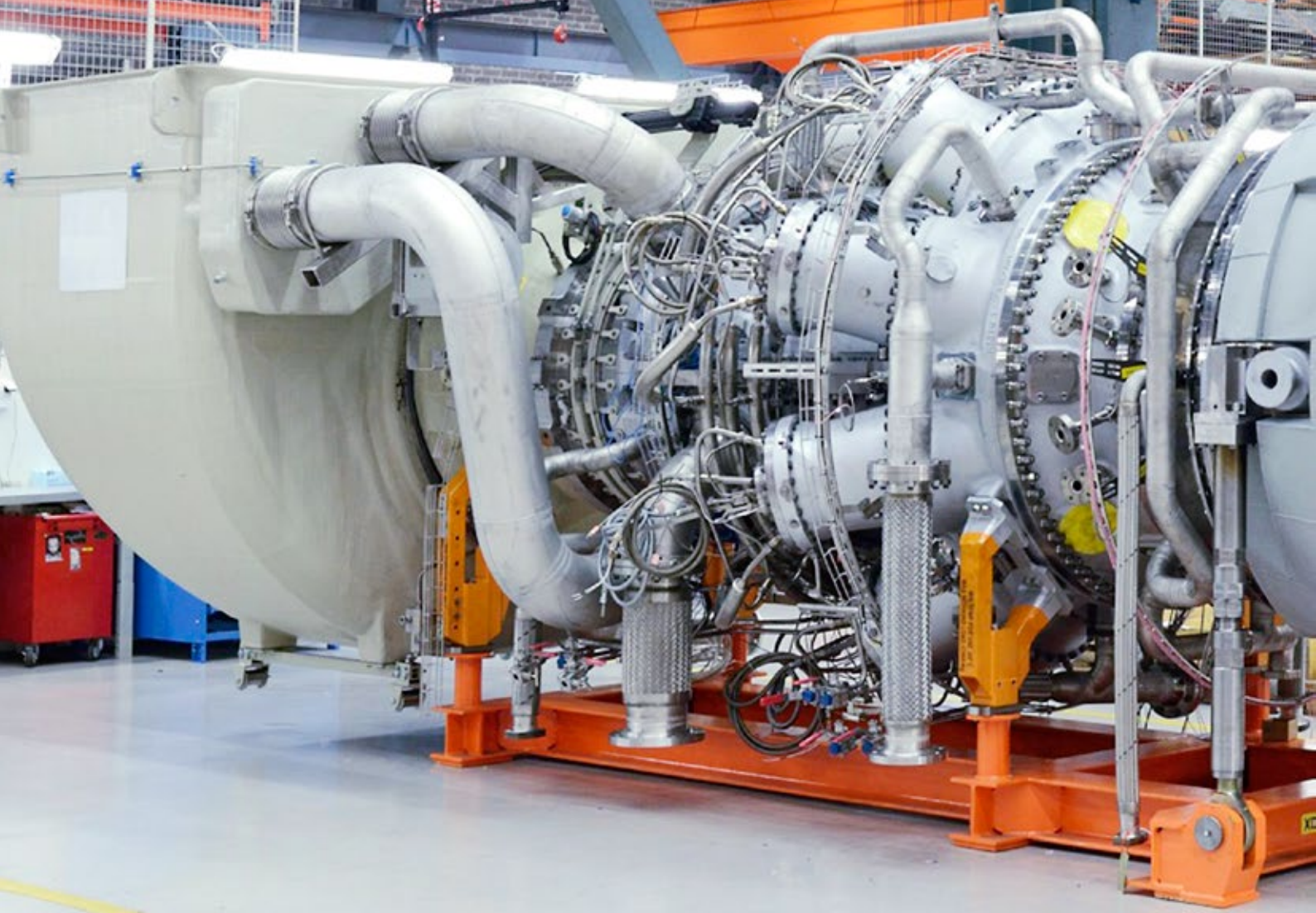
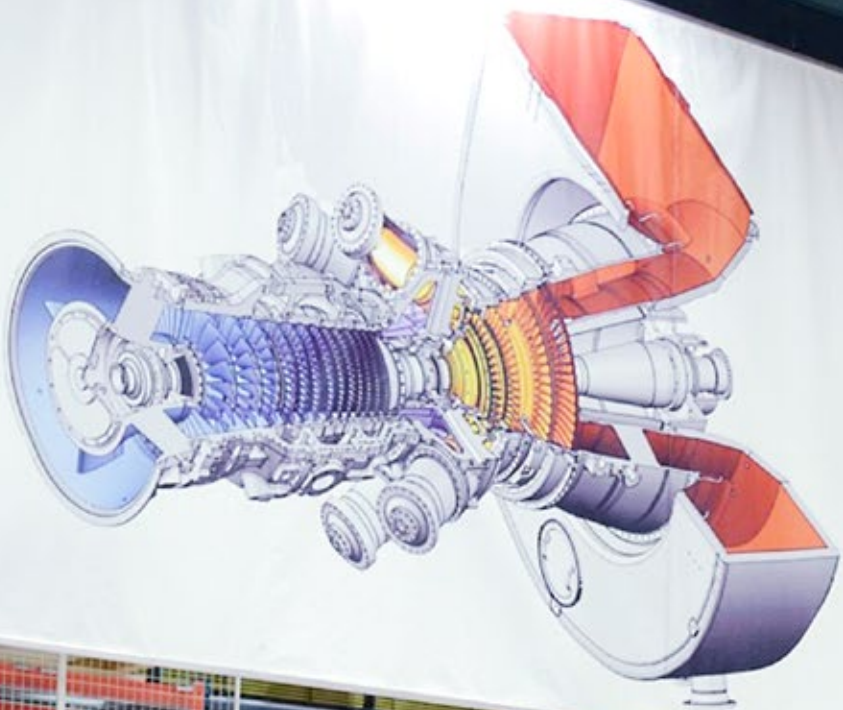
Power Generation: ISO 37.03 MW(e) · Mechanical Drive: 38.19 MW

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Core Assembly



32 ton

# SGT-750 Industrial Gas Turbine

The Siemens SGT-750 set new standards for efficiency and reliability in the industrial gas turbine segment. It was designed to deliver top-class performance, with a compact footprint, combined with extreme robustness and optimized serviceability. Now, after proving itself during years of operation, it stands out as an absolute industry benchmark, reaching for higher levels of lifetime customer value.

## High efficiency and high power output

Having been thoroughly tested and tried, the overall performance of the SGT-750 exceeds the initial launch data in all aspects. The SGT-750 has the highest power and efficiency combined with Dry Low Emissions (DLE) and is proven to be one of the most ecofriendly turbines in the world.

## Maximized uptime

From the smallest detail to package layout, the SGT-750 is designed to deliver high performance. Day in, day out. The sheer robustness and build quality makes for outstanding longevity, while the unique, built-in serviceability and smart maintenance program based on true load operation offer reliability and availability in a league of its own.

## Unprecedented flexibility

Use it where you want, hot or cold conditions, onshore or offshore, for distributed power or mechanical drive. The SGT-750 is remarkably flexible when it comes to coping with harsh conditions and different fuels. Using pre-engineered options, the package is easily tailored to any specific demand in terms of application, ambient conditions, load, code and standards. The low-weight design and small footprint makes it easy to fit in – and easy to get in place.

## Flexibility facts

- Highest performance at extreme conditions, from arctic to desert conditions, from -60 °C to 55 °C
- Fast start capability, full load in less than 10 minutes
- DLE burners offer dual fuel with online switchover capability
- Wide fuel range

In May 2013 the first SGT-750 went online at the combined heat and power plant in Lubmin, near Greifswald, Germany. Gas from the Nord Stream pipeline needs to be reheated for further distribution.

Front page: The SGT-750 combined heat and power plant in Altamira, Mexico, generates electricity and process steam for manufacturing synthetic textile fibers.





The SGT-750 gas generator can be swapped in less than 24 hours. The gas generator is rolled out with standard maintenance tools.

## Service and Maintenance Concept

The design of the SGT-750 was created with maximized serviceability and minimized load-to-load downtime in absolute focus. This ambition has resulted in a market-leading availability, based on a service plan with just 17 scheduled maintenance days over a 17 year service cycle. All in all, this means bankable productivity and faster return on investment.

### Online monitoring and remote diagnostics

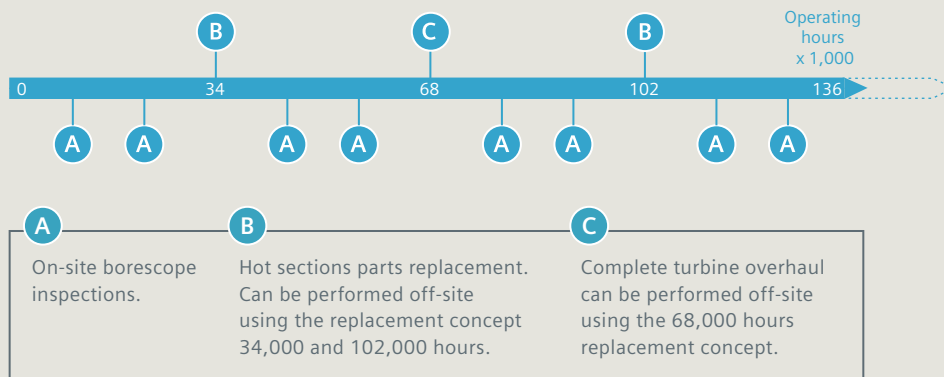
All SGT-750 are mapped with infrared (IR) cameras during engine delivery test and during regular scheduled inspections.

The IR cameras enable early, non-destructive detection of possible deviations, helping to keep the turbine in a good, healthy condition. The IR images also speed up the service procedure by giving accurate diagnostic information to technicians. Online monitoring, expert performance data analysis and fleet data comparisons form a solid foundation for such evaluations.



All customers benefit from our 24-Hour Global Helpdesk Service and dedicated project management. In combination with remote diagnostic service you will increase your turbines availability, reliability and operating performance for maximized life cycle profit.

## Maintenance Cycle



### Offsite Maintenance

- 1 day A-inspection (Borescope)
- 2 days B-inspection (Gas Generator Exchange)
- 5 days C-inspection (Gas Generator Exchange with Power Turbine Inspection)

### Onsite Maintenance

- 1 day A-inspection (Borescope)
- 12 days B-inspection (Hot Section Inspection)
- 16 days C-inspection (Major Overhaul)

Onsite and offsite maintenance is the two alternatives of doing planned service for the SGT-750. For offsite maintenance the core that will be served is swapped keeping the downtime of your equipment to an absolute minimum. For onsite maintenance the core will be served and the service can be made on site or in a local workshop. The typical four years of base load operation before the machinery is open the first time, is an outstanding, market leading figure in itself. Yet, with lower loads and fully customer-managed inspections, time between overhauls can be easily increased by several thousands of hours.

# Maximized Uptime – 17 Maintenance Days in 17 Years

### Maintenance cycle

The maintenance cycle, based on onsite and offsite maintenance, gives a recommendation for preventive maintenance where all aspects are covered regarding replacement parts and manpower. It includes all auxiliaries and driven equipment as well accounting for load variations, site conditions and fuel quality.

### Optimized spare part consumption

An optimized replacement schedule including component refurbishment ensures maximum usage of hot gas path components and lowest life cycle cost. On-site parts storage is optimized to include only operation consumables and operation back-up parts, since components needed for planned maintenance are delivered from Siemens in time for the respective maintenance outages.

### Customer availability

Siemens has extensive experience in the maintenance and field service of gas turbines spanning over 50 years. Project management is our specialty. Our experience gained in hundreds of successful projects enables us to plan each inspection exactly. And we never leave a site until everything is up and running properly.



### Availability facts

- Robust DLE system, does not require tuning of combustion system due to seasonal changes
- 17 days in 17 years maintenance concept
- 24 hour gas generator swap from load to load
- Option to choose between on- or offsite maintenance
- 34,000 operating hours between hot parts inspection and 68,000 operating hours between major overhaul for base load operation

# SGT-750 Technology and Performance

## 1 Single rigid compressor rotor body

The rigid rotor body is the foundation of the rotor stability in the SGT-750. This stability enables more uniform and smoother run-ups in all conditions

## 2 Horizontal and vertical split casings

Horizontal split for unbeatable accessibility in the compressor and vertical split for optimized clearances and stability in the turbine. This combination of casing design unites the best qualities of two concepts into one.

## 3 Variable guide vanes

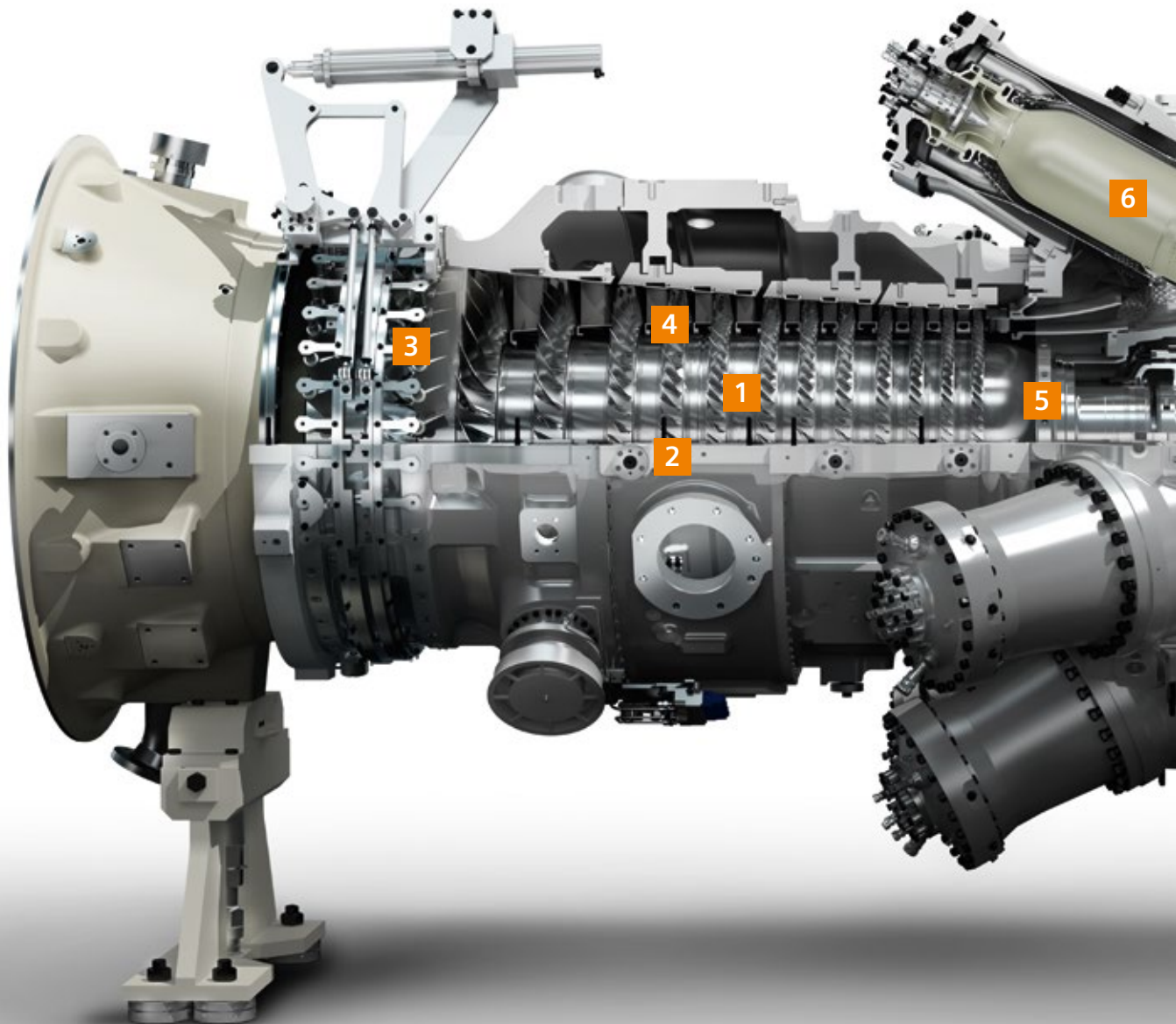
Two variable guide vanes in the compressor offer optimized performance even in the most extreme conditions.

## 4 13-stage axial-flow compressor

The compressor is a 13-stage axial flow compressor with a 23.8:1 pressure ratio. It offers a controlled diffusion airfoil for high efficiency. The axial blade attachment grooves allow complete compressor reblading without rotor removal.

## 5 Bearings and balancing planes

The rotor is supported by mineral-oil-lubricated long-life tilting pad bearings. Five easy-to-reach balancing planes allow field balancing without disassembly.



**6 Can combustors with DLE burners**

The can combustion chamber consists of eight cans with a double-skin serial-cooled design and eight transition ducts of double-skin parallel-cooled design, suitable for both liquid and gaseous fuels. This can design provides for excellent maintainability and easy-access exchangeability without casing disassembly.

**7 Two-stage compressor turbine**

The two-stage compressor turbine blades are made of state-of-the-art proven materials with several years of confirmed performance. The blades and guide vanes are cooled with a combination of internal convective cooling and film cooling.

**8 Online monitoring**

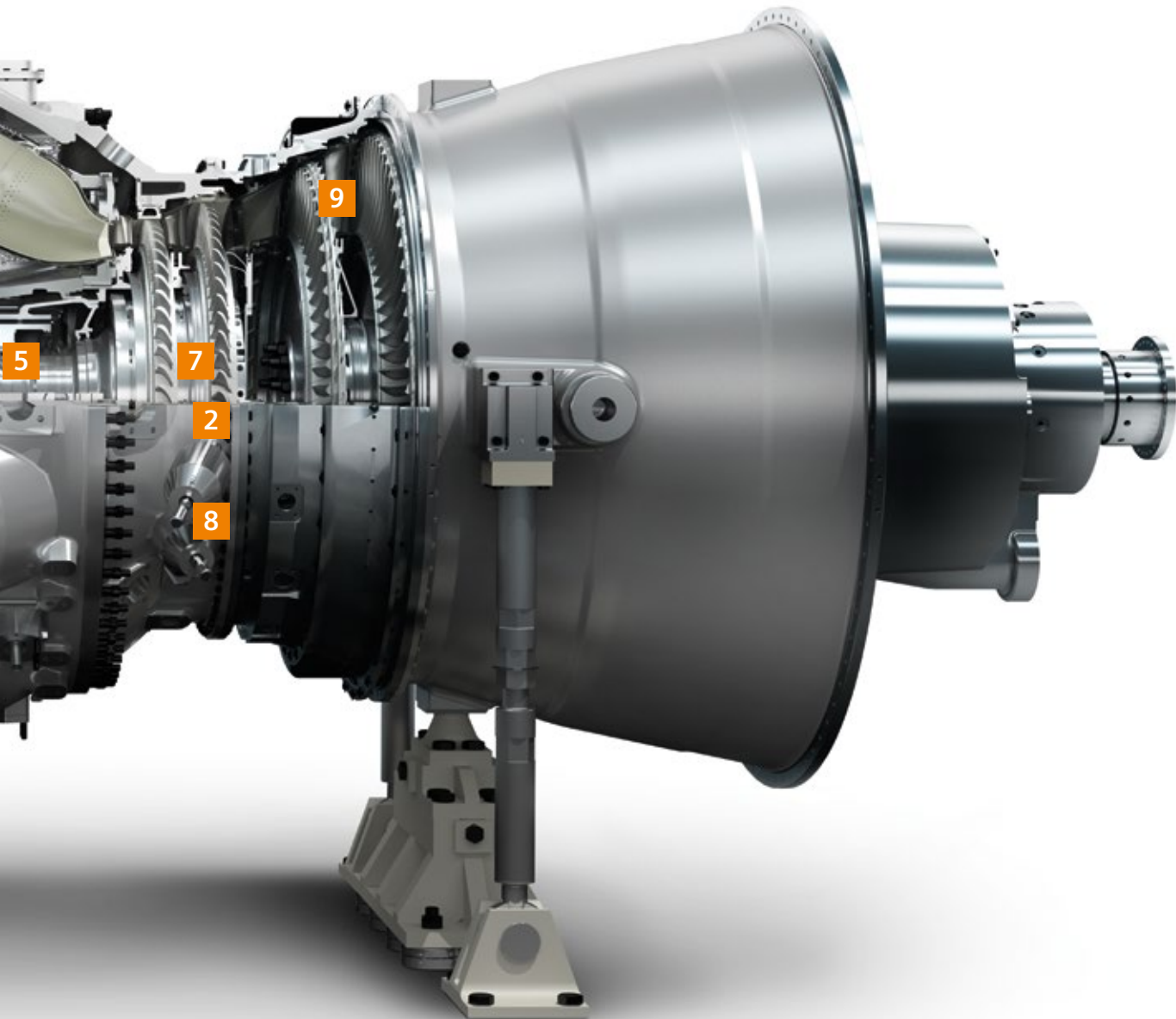
All SGT-750 are mapped with infrared (IR) cameras during engine delivery test and during regular scheduled inspections.

**Early warning – faster maintenance**

The IR cameras enable early detection of possible deviations, helping to keep the turbine in a good, healthy condition. The IR images also speed up the service procedure by giving accurate diagnostic information to technicians.

**9 Two-stage high-speed free power turbine**

The free turbine is a two-stage high-speed module, nominally running at 6,100 rpm.



# SGT-750 for Power Generation

## Compact and reliable

The SGT-750 makes a perfect option for power generation applications. The fast start-up and cycling capability both support intermediate to continuous operation with improved turndown capability. Through the use of a free power turbine, the SGT-750 is also well suited where grid requirements call for maintained power in case of frequency drop. Siemens Dry Low Emission combustion system optimizes fuel use and minimizes NO<sub>x</sub> emissions, all to contribute to highest profitability and lowest environmental impact.

- Lightweight construction offers leading weight-to-power ratio
- Small footprint means easy fitting
- Modular and flexible package design
- Single-lift capability
- Reliability >99%

## Applications for power generation

Siemens offers a wide range of solutions for power generation, from stand-alone installations to complete power plants.

### Industrial power generation

- Simple-cycle and combined-cycle power plants for base load, standby power and peak lopping.
- Cogeneration for industrial plants with high heat load and district heating schemes.

### Power generation in the oil and gas industry

- Onshore: for oil field service, refinery applications, emergency and standby power generation, including highly efficient cogeneration solutions for oil & gas applications.
- Offshore: on oil platforms and FPSO (Floating Production, Storage & Offloading) vessels.



The power gen package measures 20.3 x 4.8 m.

### Power output: 37.03 MW(e)

- Fuel: Natural gas
- Frequency: 50/60 Hz
- Electrical efficiency: 39.5 %
- Heat rate: 9,120 kJ/kWh (8,644 Btu/kWh)
- Compressor pressure ratio: 23.8:1
- Exhaust gas flow: 114.2 kg/s (251.8 lb/s)
- Exhaust temperature: 459° C (858° F)
- NO<sub>x</sub> emissions: ≤ 15 ppmV (DLE, corrected to 15 % O<sub>2</sub> dry)

The SGT-750 gas turbine train comes mounted on a base frame with single-lift capability and a base-frame split between driver and driven equipment. For onshore applications, driven equipment can also be located on a separate concrete foundation. The lubrication oil system is installed inside the package and all auxiliary systems are mounted on the base frame. Liquid fuel, water injection and fire-fighting systems are kept separate.



# SGT-750 for Mechanical Drive

## Robust and reliable

The SGT-750 with its twin shaft configuration is designed for mechanical drive, driving compressor or pumps either onshore or offshore. The free power turbine enables the turbine to start with a minimum of starting power even when connected to fully pressurized compressor loops. The robustness and built-in serviceability provides minimum downtime days and ensure maximum customer value.

- Minimized starting power
- High starting torque
- Variable compressor speed, 50-105%
- High load on low power turbine speed
- Reliability >99%

## Applications for mechanical drive

Siemens offers a full range of extended scope and turnkey solutions for mechanical drive applications. Utilizing decades of experience, no application in any environment is impossible.

## Compressor applications

- Gas injection, gas processing, LNG , pipelines as well as other oil & gas applications.
- Air separation and petrochemical industry.

## Pump applications

- Water injection and fluid transmission applications.

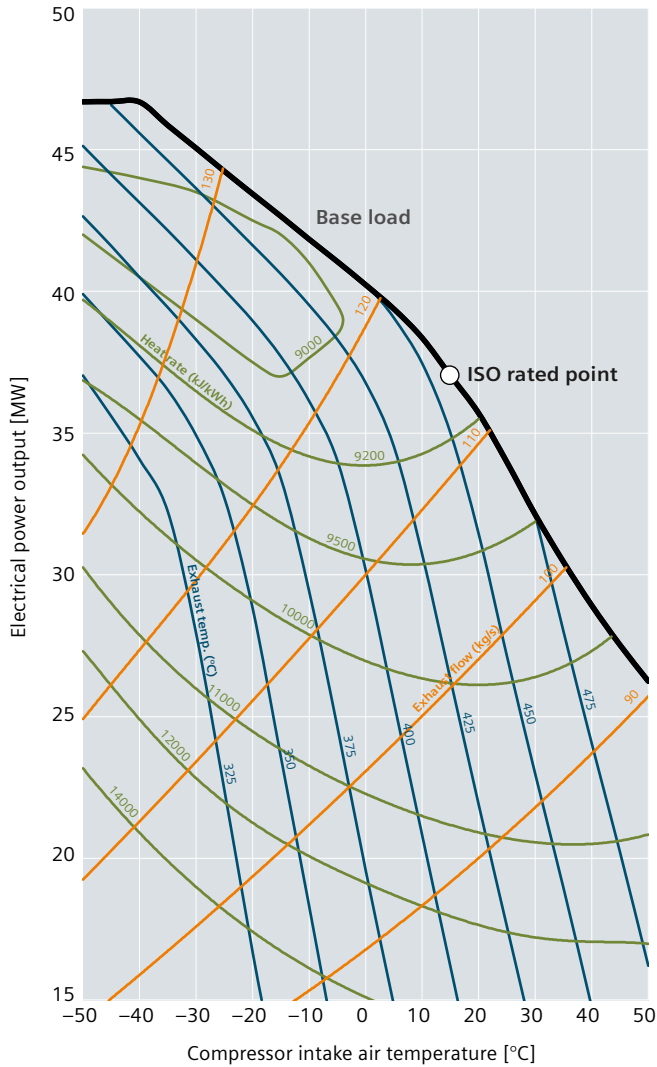
The driver package footprint measures 12.8 x 4.3 m.

**Shaft power:**  
51,213 bhp (38.19 MW)

- Fuel: Natural gas
- Efficiency: 40.7 %
- Heat rate: 8,840 kJ/kWh (6,248 Btu/bhph)
- Turbine speed: 3,050–6,405 rpm (50-105%)
- Compressor pressure ratio: 23.8:1
- Exhaust gas flow: 114.2 kg/s (251.8 lb/s)
- Temperature: 459° C (858° F)
- NO<sub>x</sub> emissions: ≤ 15 ppmV (DLE, corrected to 15 % O<sub>2</sub> dry)



# SGT-750 Performance Data

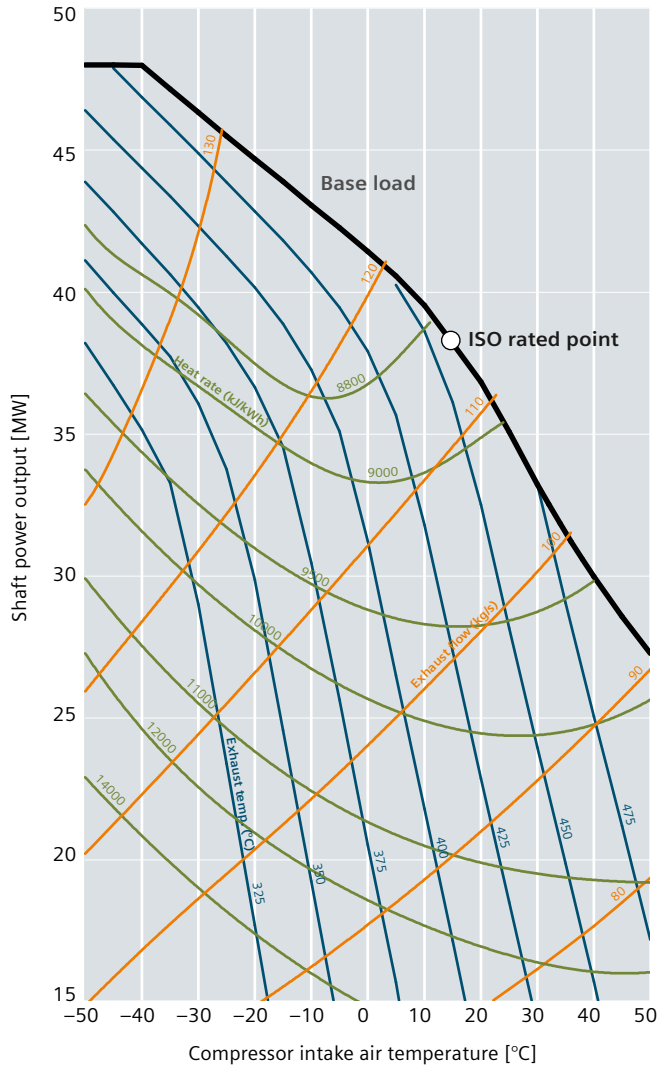


## Nominal performance SGT-750 Power Generation

Gaseous fuel

### ISO Operating conditions:

|                         |                      |
|-------------------------|----------------------|
| Ambient pressure        | 1.013 bar (a)        |
| Relative humidity       | 60%                  |
| Power turbine speed     | 6,100 rpm            |
| Gas                     | 100% CH <sub>4</sub> |
| Inlet duct press. loss  | 0 mbar               |
| Outlet duct press. loss | 0 mbar               |
| Generator frequency     | 50 Hz                |
| Power factor            | 0.9                  |

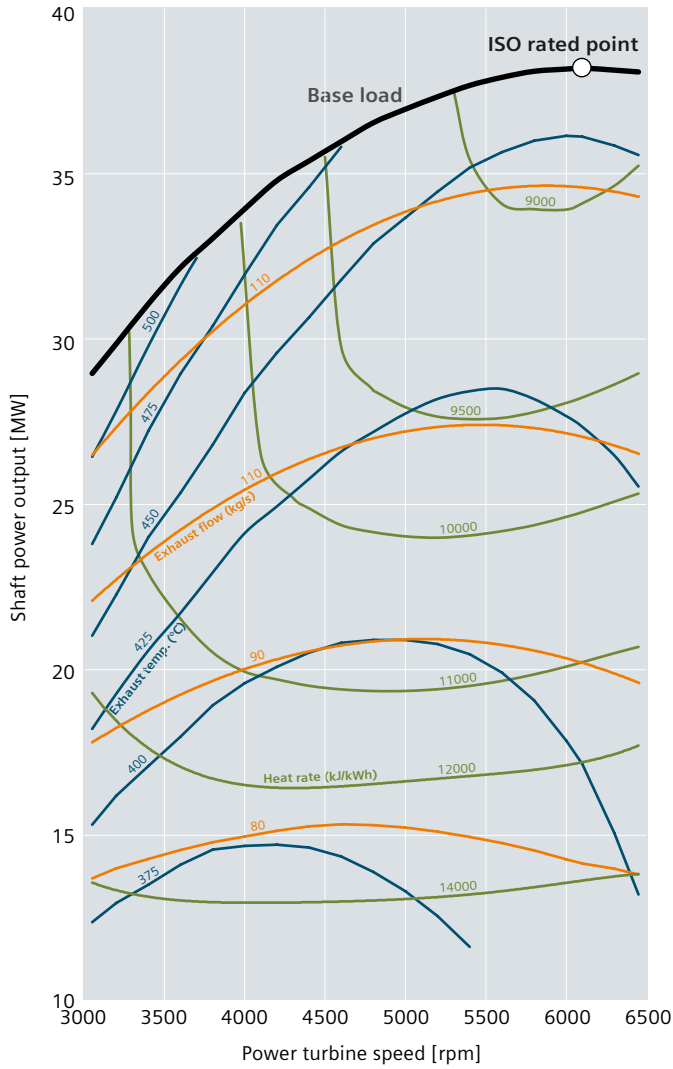


## Nominal performance SGT-750 Mechanical Drive

Gaseous fuel

### ISO Operating conditions:

|                         |                      |
|-------------------------|----------------------|
| Ambient pressure        | 1.013 bar (a)        |
| Relative humidity       | 60%                  |
| Power turbine speed     | 6,100 rpm            |
| Gas                     | 100% CH <sub>4</sub> |
| Inlet duct press. loss  | 0 mbar               |
| Outlet duct press. loss | 0 mbar               |



## Nominal performance SGT-750 Mechanical Drive

Gaseous fuel

### ISO Operating conditions:

|                         |                      |
|-------------------------|----------------------|
| Ambient pressure        | 1.013 bar (a)        |
| Ambient temperature     | 15°C                 |
| Relative humidity       | 60%                  |
| Gas                     | 100% CH <sub>4</sub> |
| Inlet duct press. loss  | 0 mbar               |
| Outlet duct press. loss | 0 mbar               |



**Published by  
Siemens AG 2015**

Power and Gas Division  
Distributed Generation  
Freyeslebenstrasse 1  
91058 Erlangen, Germany

For more information, please contact  
our Customer Support Center.

Phone: +49 180 524 70 00

Fax: +49 180 524 24 71

(Charges depending on provider)

E-mail: [support.energy@siemens.com](mailto:support.energy@siemens.com)

Article-No. PGDG-B10001-00-7600

Printed in Germany

Dispo 34806

K12 130014, WS 07151.5

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